

REMARKS

Interview Statement:

Applicants appreciate the Examiner's courtesy in granting the telephone interview of October 19, 2010 with the undersigned.

In reference to paragraph [0048] of Applicants' published application (U.S. Publication No. US 2007/0141745), Applicants' representative discussed how the pores are impregnated with precursor (prior to electrolytic polymerization), by immersing in an alcohol solution of the monomer and then evaporating the solvent. The electric conductor having pores impregnated with the precursor is then subjected to electrolytic polymerization in an aqueous electrolytic solution in which the monomer is less soluble such that energization proceeds in a state in which the concentration of precursor in the pores is higher than in the electrolytic solution.

The Examiner considered the amended claims to still read on Yoshida, because the pores in Yoshida are impregnated with precursor in the first chemical oxidative polymerization step that is prior to the electrolytic polymerization.

Applicants' representative pointed out that the difference is that the precursor in Yoshida is consumed in the first chemical oxidative polymerization, such that when the conductor is then subjected to electrolytic polymerization in an electrolytic solution, the concentration of precursor in the electrolytic solution is the same as the concentration of precursor in the pores.

Applicants' representative advised that Applicants would file an RCE, together with an Amendment under 37 C.F.R. § 1.114(c), which is the Amendment presented herein, which specifically claims this difference.

Response to Office Action:

Claims 1-12, 14-21, 23 and 24 stand rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Publication No. US 2003/0133256 A1 to Yoshida et al.

Particularly, as set forth in the Advisory Action dated September 15, 2010, Working Example D1 of Yoshida et al was cited as disclosing preparation of a solid electrolytic capacitor by forming a first conductive polymer film by chemical oxidative polymerization, and then forming a second conductive polymer film by electrolytic oxidative polymerization on the first conductive polymer film. Further, because the concentration of precursor (3 g of precursor and 80 g of solution) in the first polymerization solution is greater than the precursor concentration (10 g of precursor and 600 g of solution) in the electrolytic solution, the Examiner considered that Yoshida meets the terms of claim 1.

In response, Applicants amend the claims to clarify the difference between the present invention and Yoshida et al as follows.

The method of the present invention is characterized by passing an electric current through an electrolytic solution to form a semiconductor layer on the electric conductor by energization in a state in which the concentration of semiconductor layer-forming precursor in the pores of the electric conductor is higher than the concentration of semiconductor layer-forming precursor in the electrolytic solution.

Differences between Amended Claim 1 and Yoshida et al

In Working Example 1 of Yoshida et al, the concentration of 3,4-ethylenedioxythiophene as a precursor used in the chemical oxidative polymerization is 3.6 wt% (3 g / (3 g + 70 g + 10 g)). Electrolytic oxidative polymerization is performed after the chemical oxidative polymerization is completed (i.e., after the precursor is consumed). 3,4-ethylenedioxythiophene

as a precursor used in the electrolytic oxidative polymerization is present in an amount of 1.6 wt % (10 g / (10 g + 100 g + 500 g)).

Although Working Example 1 of Yoshida et al might satisfy the requirements of present claim 1 in the case where chemical oxidative polymerization is not performed, the precursor is consumed and the precursor does not remain in the pores due to the chemical oxidative polymerization. Therefore, when immersed in the electrolytic sensor, the precursor concentration in the pores is the same as that in the electrolytic solution at the time of energization in the electrolytic oxidative polymerization.

Thus, Yoshida et al does not meet amended claim 1 which requires forming the semiconductor layer by energization in the electrolytic solution in a state in which the concentration of semiconductor layer-forming precursor in the pores is higher than the concentration of semiconductor light-forming precursor in the electrolytic solution.

As described at page 14, lines 12 to 20 of the present specification, when a semiconductor layer is formed by energization in the state that the concentration of semiconductor layer-forming precursor in the pores of the electric conductor is higher, the semiconductor is formed in the pores in a larger amount as compared with conventional methods. As a result, the impregnation ration of the semiconductor in the capacitor thus produced can be successfully as high as 87% or more, preferably 90% or more.

Separate Patentability of Claim 2

In paragraph [0039] of Yoshida et al, conductive polymer films 301 to 303 are formed after forming manganese dioxide (semiconductor) by pyrolysis of manganese nitrate (precursor). The formation of a manganese dioxide semiconductor film in [0039] of Yoshida et al is not by electrolytic oxidative polymerization, but rather by pyrolysis. Although conductive polymer

films 301 to 303 are formed by electrolytic oxidative polymerization, because the electrolytic solution of Yoshida et al must contain a semiconductor layer-forming precursor, the electrolytic oxidative polymerization of [0039] also does not suggest present claim 2 where the electrolytic solution does not contain a semiconductor layer-forming precursor.

That is, present claim 2 is directed to a preferred embodiment of the invention which comprises forming a semiconductor in the pores and in the vicinity of the pores by energization with an electrolytic solution not containing a semiconductor layer-forming precursor. Namely, the semiconductor layer is made from precursor present in the pores of the electric conductor before energization by passing an electric current through the electrolytic solution not containing a semiconductor layer-forming precursor to form a semiconductor layer on the electric conductor from precursor present in the pores.

Thus, claim 2 is also patentable over Yoshida et al.

Claim 22 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Yoshida et al.

Applicants rely on the response above with respect to the rejection of claims 1-12, 14-21, 23 and 24 over Yoshida et al. As shown above, Yoshida et al does not teach, disclose or otherwise suggest forming the semiconductor layer by energization in the electrolytic solution in the state in which the concentration of semiconductor layer-forming precursor in the pores is higher than the concentration of semiconductor layer-forming precursor in the electrolytic solution.

Withdrawal of all rejections and allowance of claims 1-25 is earnestly solicited.

AMENDMENT UNDER 37 C.F.R. § 1.114(c)
Appln. No.: 10/576,416

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In the event that the Examiner believes that it may be helpful to advance the prosecution of this application, the Examiner is invited to contact the undersigned at the local Washington, D.C. telephone number indicated below.

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Respectfully submitted,



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